

Remarks

Reconsideration of the rejections set forth in the Office Action dated November 15, 2005 is respectfully requested. Claims 1-6, 8-11, 19-27, 37-42, and 44 have been rejected. Claim 43 has been objected to. **It is noted that the Examiner has failed to comment on the disposition of claim 45.** Claim 45 was added in the Amendment dated September 27, 2005. The Applicants respectfully request that the Examiner clarify the disposition of claim 45, so that the Applicants may properly address this claim as necessary.

Although the Examiner has indicated that claims 1-6, 8-11, 19-27, and 37-44 are currently pending, the Applicants respectfully submit that, in fact, claims 1-6, 8-11, 19-27, and 37-45 were pending prior to the filing of this Amendment. As new claim 46 has been added with the filing of this Amendment, claims 1-6, 8-11, 19-27, and 37-46 are currently pending.

Claims 1, 19, 24, 44, 39, and 45 have each been amended to recite “a group” rather than “the group.” Claim 44 has additionally been amended to correct minor typographical errors. New claim 46 recites that a nodal diverse constraint specifies that any nodes in a primary circuit path between the first node and the second node are not included in the alternate circuit path, and that a link diverse constraint specifies that any links in the primary circuit path between the first node and the second node are not included in the alternate circuit path. Support for this new claim may be found in the Specification, as for example on page 11.

Claim Objections

Claim 44 has been objected to for having informalities. In a sincere effort to overcome the Examiner’s objections to claim 44, claim 44 has been amended to correct the typographical errors noted by the Examiner.

Rejections under 35 U.S.C § 112

Claims 1-6, 8-11, 19-27, and 37-44 have been rejected under 35 U.S.C § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicants regard as the invention. Claims 1, 19, 24, 39, and 44 have each been amended to provide proper antecedent basis. It is noted that claim 45 has also been amended to provide proper antecedent basis, although the Examiner has apparently not considered claim 45.

In view of the amendments made to claims 1, 19, 24, 39, and 44, it is respectfully submitted that the rejections of claims 1-6, 8-11, 19-27, and 37-44 have been rejected under 35 U.S.C § 112, second paragraph, have been overcome.

Rejections under 35 U.S.C § 103

Claims 1-3, 5, 8-11, 19, 21-23, 24, 26, 27, 37, and 38 have been rejected under 35 U.S.C § 103(a) as being unpatentable over Allen, U.S. Patent Publication No. 2001/0032271 (Allen) in view of Dravida et al., U.S. Patent No. 5,253,238 (Dravida). Claims 4, 6, 20, 25, 39-42, and 44 have been rejected under 35 U.S.C § 103(a) as being unpatentable over Allen in view of Dravida as applied to claims 1, 5, 12, 17, 19, and 24, and further in view of Applicant's prior art.

1. Independent Claim 1, 19, 24 and their respective dependents

Independent claim 1 requires that a device includes a route generator and a list mechanism. The route generator is arranged to generate an alternate circuit path between a first node and a second node using a list mechanism stored on a memory. The route generator is arranged to accept an input that is arranged to specify one of a nodal diverse constraint and a link diverse constraint for the alternate circuit path. The input is also arranged to specify circuit characteristics for a primary circuit path and for the alternate circuit path. The alternate circuit

path is generated so as not to include the first element identified by the list mechanism, and is not affected by a failure of the first element.

List Mechanism

The cited art also does not appear to disclose a list mechanism that is stored in memory. The Examiner has argued, as for example on page 10 of the Office Action dated November 15, 2005, that Allen teaches of a list mechanism by teaching that a Bloom filter is used to store a route digest as a bit map. It is respectfully submitted that Allen does not appear to teach that a Bloom filter is used to **store** a route digest as a bit map. At paragraph [0034], Allen discloses:

“... a Bloom filter may be used to compress the route digest for paths across such a network into a bitmap...”

Further, at paragraphs [0037] and [0038], which are specifically cited by the Examiner, Allen discloses:

“Once the Bloom filter for an initial path is constructed and received by the originating node ... Now, a path establishment request message for the second path may be accompanied with the route digest (in the form of the constructed Bloom filter) for the initial path...”

The Applicants are unable to locate any teaching in Allen of actually storing a route digest as a bitmap, and submit that Allen appears only to disclose that a route digest is compressed into a bitmap and accompanies a path establishment message. The route digest is not disclosed as being stored anywhere. The Applicants fail to understand why the Examiner believes that storing a bitmap in memory is inherent, as there is no suggestion in Allen of doing anything more than creating a bitmap and sending a bitmap. Dravida also does not appear to teach of storing a route digest. As such, claim 1 is believed to be allowable over the cited art for at least this reason.

Input of a Nodal Diverse Constraint or a Link Diverse Constraint

Claim 1 specifies the ability to specify an input of either a nodal diverse constraint or a link diverse constraint. Specifying an input of either a nodal diverse constraint or a link diverse constraint allows an alternate path to be routed to include either no nodes that are included in a corresponding primary path or no links that are included in the primary path, respectively. As such, the routing of an alternate path may occur with a relatively high level of efficiency (Specification, on page 11 at lines 1-4).

The Examiner states, on page 10 of the Office Action dated November 15, 2005, that he does not believe that “the claim language is clear enough to indicate that the input specifying a nodal diverse constraint and a link diverse constraint specifies constraining a second path to not include nodes from a first path and constraining a second path to not include links from a first path, respectfully.” The Applicants respectfully disagree with the Examiner’s assertion. It is submitted that a link diverse constraint and a nodal diverse constraint specifically, and clearly, specify constraining a second path to not include links from a first path and constraining a second path to not include nodes from a first path, respectively. A link diverse constraint clearly specifies that no links are common between a first path and a second path, and a nodal diverse constraint clearly specifies that no nodes are common between a first path and a second path (see, *e.g.*, page 11 of the Specification).

At paragraph [0037], Allen teaches as follows:

“...In order to reduce likelihood that the secondary path shares resources and therefore a common point of failure with the initial path, originating node 102a may establish an explicit path having different routing nodes using MPLS ER-LSP. Alternatively, again, any other suitable path establishment mechanism may be used to establish the secondary path. So, for example, hop-to-hop LSR path establishment could be used.”

At paragraph [0038], Allen states:

“Each node receiving this second path establishment message, along the subsequent path, may **use local knowledge of**

resources used by hops to and from the node to assess overlap in these resources and the primary path to make routing decisions in manners exemplary of the present invention....”
[emphasis added]

Paragraphs [0037] and [0038] appear to disclose establishing paths having different routing nodes and of using a path establishment request message. However, Allen fails to disclose an **input** accepted by a route generator that specifies any constraint. A path establishment request message is not disclosed as being anything more than a message which requests that a second path be established. While the message may include a route digest, the route digest only specifies nodes included in an initial path. There is no disclosure that the path establishment request message is associated with an input that specifies either a nodal diverse constraint or a link diverse constraint. Instead, the Applicant notes that Allen teaches of using local knowledge to assess overlap in resources to make routing decisions. Such local knowledge is not disclosed or even remotely suggested as being an input that is accepted by a route generator, and is not disclosed as associated with either a nodal diverse constraint or a link diverse constraint. Dravida fails to overcome this deficiency of Allen. Therefore, claim 1 is believed to be allowable over the cited art for at least this additional reason.

Input arranged to specify Circuit Characteristics

On page 4 of the Office Action dated November 15, 2005, the Examiner has admitted that Allen fails to disclose an input arranged to specify circuit characteristics for a primary path and for an alternate circuit path. However, the Examiner has argued that Dravida overcomes this deficiency of Allen. The Applicants respectfully disagree. In column 9, at lines 17-44, Dravida discloses computing the shortest distance in hops between ‘i’ and destination node ‘D,’ and that the shortest distance in hops is available as a result of an exclusionary tree routing process. There is no teaching or suggestion, however, that an input that specifies a circuit characteristic, *e.g.*, that an input layer should be a shortest distance, is an input to a route generator. At best, Dravida teaches that layer generation may involve computing a shortest distance between hops, but fails to suggest an input to a layer generator that specifies computing

the shortest distance between hops. Generating a layer by computing a shortest distance between hops does not teach or suggest an input that is arranged to specify circuit characteristics.

Further, regarding an input that specifies circuit characteristics for an alternate circuit path, in FIG. 24 and the corresponding description, Dravida does not appear to discuss any input arranged to specify circuit characteristics. Dravida appears to discuss summing weights of nodes, but there is no suggestion that an input to an alternate route generator specifies that weights are summed. As Dravida also appears to fail to disclose an input arranged to specify circuit characteristics for a primary path and for an alternate circuit path, claim 1 is believed to be allowable over the cited art for at least this reason as well.

Claims 2-6, 8-11, 37, 38, and 46 each depend either directly or indirectly from claim 1, and are therefore each believed to be allowable over the cited art for at least the reasons set forth with respect to claim 1. Each of these claims recites additional limitations which, when considered in light of claim 1, are believed to further distinguish the claimed invention over the cited art. By way of example, dependent claim 9 recites that when an input specifies a link diverse constraint, the first element is a link. The Examiner has argued that Allen teaches of this limitation, and has argued that “nodes are separated by links.” While it may be true that nodes are separated by link, the Applicants fail to understand how this is relevant to claim 9. Allen does not teach of a link diverse constraint and, at best, paragraphs [0037] and [0038] of Allen disclose that paths may have different routing nodes. It is noted that two nodes may be separated by more than two links. Hence, an alternate circuit path that does not include a link that is in a primary circuit path may include a node that is in the primary circuit path. As Allen does not teach or suggest an input that is a link diverse constraint, or that a first element is a link, claim 9 is believed to be allowable over Allen for at least this reason.

Independent claims 19 and 24 recite similar limitations as recited in claim 1. Hence, claims 19, 24, and their respective dependents are each believed to be allowable over the cited art for at least the reasons set forth above with respect to claim 1.

2. Independent Claim 39 and its dependents

Independent claim 39 recites a device for computing circuit paths between a first node and a second node in a network that includes at least one protected element. The device includes a memory, a route generator, and a list mechanism. The route generator generates a primary circuit path including a first plurality of elements, and is arranged to accept an input that specifies a nodal diverse constraint or a link diverse constraint for an alternate circuit path. The input is also arranged to specify a load characteristic that is to be accounted for when the alternate circuit path is generated. The list mechanism identifies the first plurality of elements and the protected element, and the route generator generates the alternate circuit path using the list mechanism and the input such that the alternate circuit path does not include the first plurality of elements or the protected element.

The Examiner has argued that Allen in view of Dravida and the Applicants admitted prior art (AAPA) teach the invention of claim 39. The Examiner argues that AAPA teaches that protected links are known. While protected links are known, the Applicants fail to understand why the Examiner argues that because protected links are known, it is somehow obvious that protected elements are included in a list mechanism such that protected elements are not included in an alternate circuit path.

First, as discussed above with respect to claim 39, Allen does not teach of storing a list mechanism in memory. Second, the route digest of Allen that the Examiner equates to a list mechanism includes (note that the Applicant does not agree that a route digest is the same as a list mechanism) includes information regarding resources in established paths, and there is no suggestion of including any other resources other than those included in the established paths. The Examiner has argued, on pages 7 and 8 of the Office Action dated November 15, 2005, that “it would have been obvious to modify Allen in view of Dravida by enabling the alternate circuit path to avoid the protected link and identify it as being inaccessible in order to avoid the high costs incurred of traversing the protected link.” Dravida does not overcome the deficiency of Allen pertaining to a list mechanism, as the so-called list mechanism of Allen does not identify

anything except elements in a path. Adding elements that are not to be included in a path to a route digest is not logical, as the route digest of Allen identifies nodes through which a route passes. A combination of Allen and Dravida **does not suggest any mechanism or digest that includes elements other than elements already included in a path.** At best, a combination of the cited art would teach that a primary circuit path traverses a protected link and hence, that a route digest could include the protected link that is included in the primary circuit path. Therefore, claim 39 is believed to be allowable over the cited art for at least the reasons set forth.

Further, claim 39 recites a route generator arranged to accept an input that is arranged to specify a load characteristic that is to be accounted for when an alternate circuit path is generated. The Examiner has argued that Dravida teaches this feature at lines 41-52 of column 10. At lines 41-52 of column 10, Dravida is discussing FIG. 26, which is described at lines 23-28 of column 4 as follows:

“FIG. 26 is a flow chart illustrating the process for **giving higher priority to packets that are routed on uncongested routes and for allowing marked packets that travel on alternate routes because of congestion** to be discarded in the event that heavy traffic is encountered;” [emphasis added]

Dravida discloses, at lines 41-52 of column 10, that the congestion on links is considered when packets are accepted for transmission over a link. Alternate routes are already generated, and in use, when congestion on links is considered. There is no teaching that congestion on the links is accounted for when the alternate routes are generated. Considering congestion on links when identifying a routing path does not reasonably suggest an input that specifies a load characteristic that is to be accounted for when an alternate circuit path is **generated**. Accordingly, claim 39 is believed to be allowable over the cited art for at least this additional reason.

Claims 40-43 each depend from claim 39 and are, therefore, each believed to be allowable over the cited art for at least the reasons set forth above with respect to claim 39. Each of these dependent claims recites additional limitations which, when considered in light of claim 39, are believed to further distinguish the claimed invention over the art of record. By way of example, the Examiner has already indicated that claim 43 contains allowable subject matter.

3. *Independent Claim 44 and its dependent*

Independent claim 44 recites a method for computing circuit paths between a first node and a second node in a network that includes a plurality of elements. The method involves receiving an input that is arranged to specify one of a nodal diverse constraint and a link diverse constraint, and circuit characteristics for a primary and alternate circuit path. The primary circuit path is generated, and the specified circuit characteristics are accounted for in the generation. A list that identifies a first element in the primary circuit path is created and stored in memory. The alternate circuit path is generated to not include the first element and to account for the specified circuit characteristics. In generating the alternate circuit path, the stored list is accessed, and the first element is identified as being blocked from use in routing the alternate circuit path.

On pages 8 and 9 of the Office Action, the Examiner appears to address claim 44. However, his arguments relate to elements that are not, in fact, included in claim 44. For example, the Examiner states that claim 44 is a device and that a network includes at least one protected element. It is noted that claim 44 is a method claim, and that there is no recitation of any protected elements in claim 44. Further, in his rejection, the Examiner fails to address features of claim 44 such as generating a primary circuit path by accounting for specified circuit characteristics and generating an alternate circuit path by identifying a first element stored in a first list as being blocked from use. The Applicants respectfully submit that they are unable to properly address the Examiner's rejection of claim 44, as the rejection presented by the Examiner appears to be a rehashing of his rejection of claim 39, and does not actually pertain to claim 44. **It is hereby requested that the Examiner clarify his rejection of claim 44, so that the Applicants may properly respond to his rejections.**

Conclusion

For at least the foregoing reasons, the Applicants believe all claims now pending in this application are in condition for allowance and should be passed to issue. If the Examiner believes a telephone conference would in any way expedite prosecution of the application, please do not hesitate to contact the undersigned at (408)868-4096.

Respectfully submitted,

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